CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
January 9, 2015

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)

CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vacuum truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for January 9, 2015 07:00 to January 9, 2015 15:00.

Air monitoring was discontinued at the end of this period as emergency-phase work operations were completed. Unified command will officially stand down as of 06:00 on 1/10/2015 and demobilization efforts will begin.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), percent of the Lower Explosive Limit (LEL), oxygen (O_2), particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area and along the perimeter of the facility in the community near the adjacent agricultural fields. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A. Real-time air monitoring with handheld instruments was discontinued at approximately 12:00 on 1/9/2015 with the completion of emergency phase work operations.

CTEH® monitored RAESystems® AreaRAE units with a ProRAE Guardian system at four locations on the fence line of the facility within the work area. Additional units (Unit 10 and Unit 11) were also deployed. Unit 10 was deployed in the cab of an excavator supporting waste removal operations. Unit 11 was deployed along the fence line of the facility between the 120 barrel tank truck and Mission Rock Road (primarily to monitor Cl_2 concentrations near the tank truck). AreaRAE units were equipped with sensors to detect Cl_2, VOCs, LEL, H_2S, and SO_2. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B. Real-time air monitoring with a ProRAE Guardian system was discontinued at approximately 12:15 on 1/9/2015 with the completion of emergency phase work operations.

Particulate monitors were collocated with AreaRAE units 01, 02, 03, and 04 and data-logged to monitor PM_{10}. An additional unit was logged in the cab of an excavator supporting waste removal operations. Table 3 summarizes data-logged particulate monitoring data. Particulate monitoring with data-logging AM510s was discontinued at approximately 14:45 on 1/9/2015 with the completion of emergency phase work operations and the final site walkthrough by the EPA.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
January 9, 2015 07:00 – January 9, 2015 12:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range[2]
Work Area	Cl_2	MR+ / MR Pro	5	0	NA	< 0.1 ppm
	H_2S	MR+ / MR Pro	3	0	NA	< 1 ppm
	LEL	MR+ / MR Pro	5	0	NA	< 1 %
	O_2	MR+ / MR Pro	1	1	20.9	20.9 - 20.9 %
	PM_{10}	AM510/Dusttrak	3	3	0.061	0.019 - 0.137 mg/m^3
	SO_2	MR+ / MR Pro	5	0	NA	< 0.1 ppm
	VOC	MR+ / MR Pro	5	0	NA	< 0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right*

Table 2: AreaRAE Air Monitoring Summary[1]
January 9, 2015 07:00 – January 9, 2015 12:15

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range[2]
Unit 01	H_2S	1210	0	NA	< 1 ppm
	LEL	1210	0	NA	< 1 %
	SO_2	1210	0	NA	< 0.1 ppm
	VOC	1210	0	NA	< 0.1 ppm
Unit 02	H_2S	1199	5	0.1 ppm	0.1 - 0.1 ppm
	LEL	1199	0	NA	< 1 %
	SO_2	1199	0	NA	< 0.1 ppm
	VOC	1199	518	0.1 ppm	0.1 - 0.2 ppm
Unit 03	H_2S	1208	34	0.1 ppm	0.1 - 0.1 ppm
	LEL	1208	0	NA	< 1 %
	SO_2	1208	0	NA	< 0.1 ppm
	VOC	1208	0	NA	< 0.1 ppm
Unit 04	H_2S	1000	0	NA	< 1 ppm
	LEL	1000	0	NA	< 1 %
	SO_2	1000	0	NA	< 0.1 ppm
	VOC	1000	0	NA	< 0.1 ppm
Unit 10	Cl_2	438	0	NA	< 0.1 ppm
	LEL	438	0	NA	< 1 %
	SO_2	438	0	NA	< 0.1 ppm
	VOC	438	356	0.2 ppm	0.1 - 0.4 ppm
Unit 11	Cl_2	1210	0	NA	< 0.1 ppm
	SO_2	1210	0	NA	< 0.1 ppm
	VOC	1210	0	NA	< 0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 3: AM510 PM_{10} Monitoring Summary[1]
January 9, 2015 07:00 – January 9, 2015 14:45

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
11005015	AR01	1434	1434	0.032	0.011 - 0.322 mg/m^3
10503020	AR02	1762	1762	0.043	0.010 - 0.222 mg/m^3
10704075	AR03	1806	1806	0.035	0.012 - 0.286 mg/m^3
10601073	AR04	1737	1737	0.027	0.011 - 0.893 mg/m^3
10704070	Excavator 200D (AR10)	531	531	0.012	0.001 - 0.718 mg/m^3

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

Appendix A

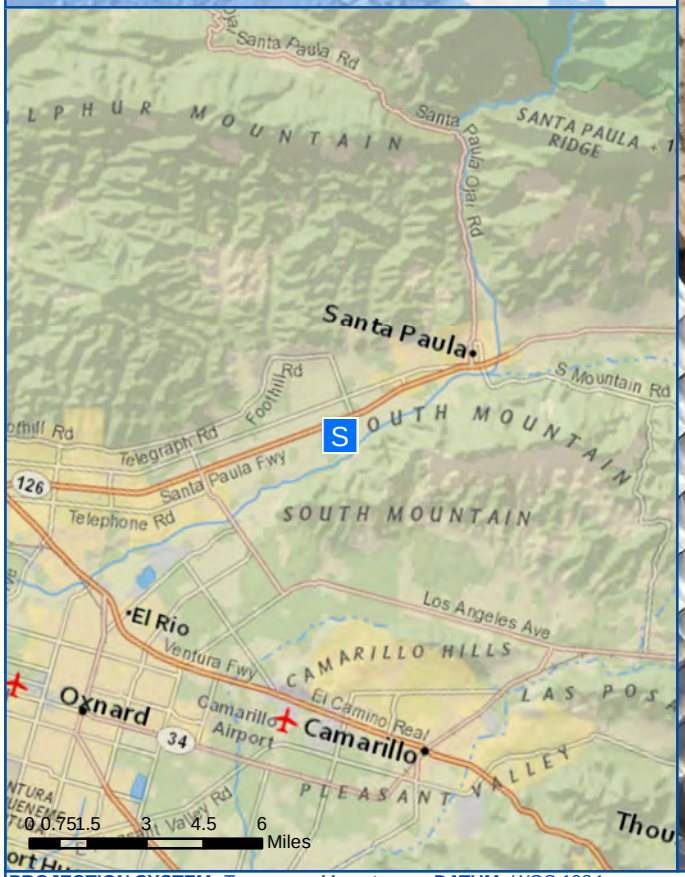
Incident Maps:

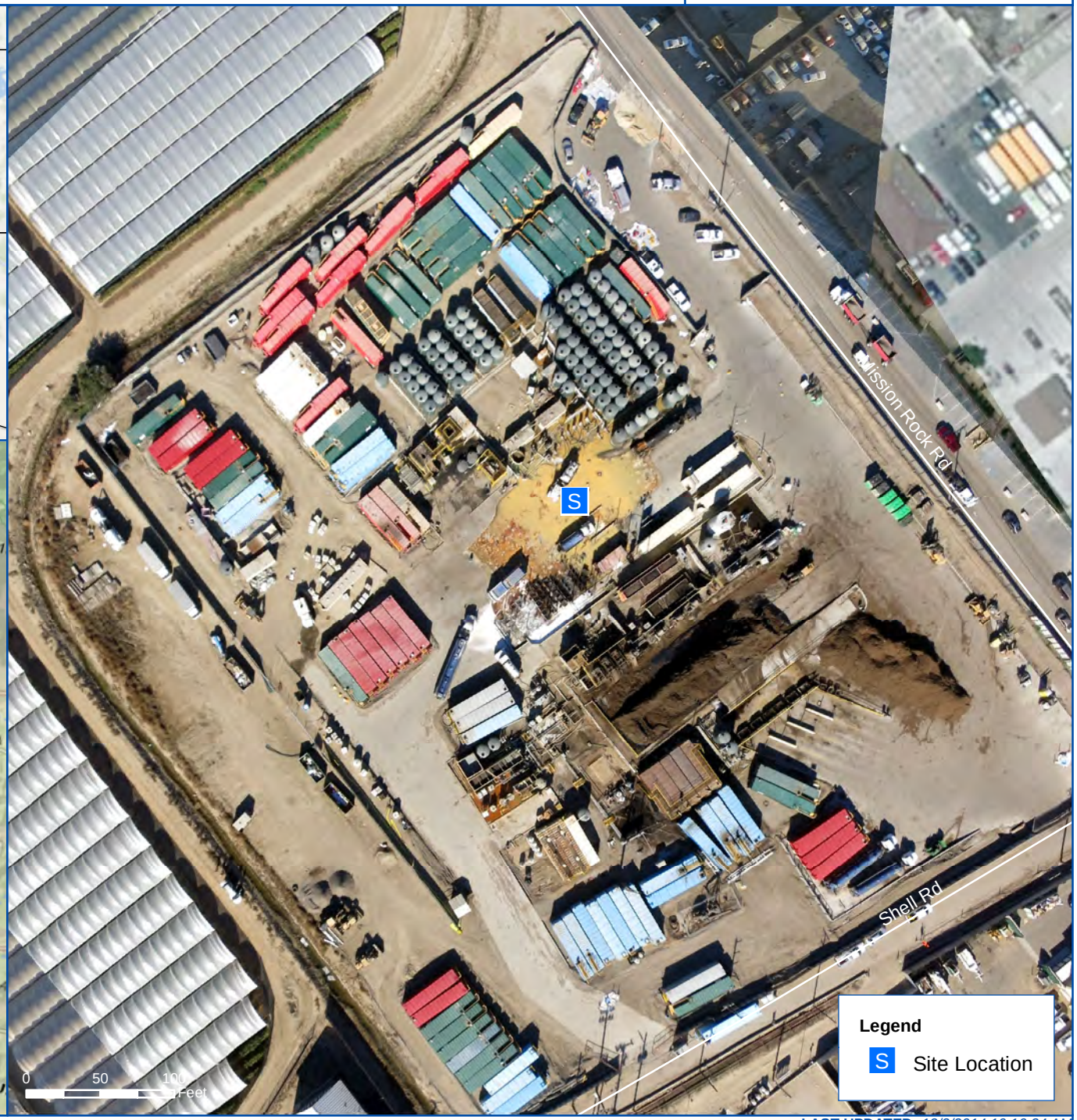
Real-Time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



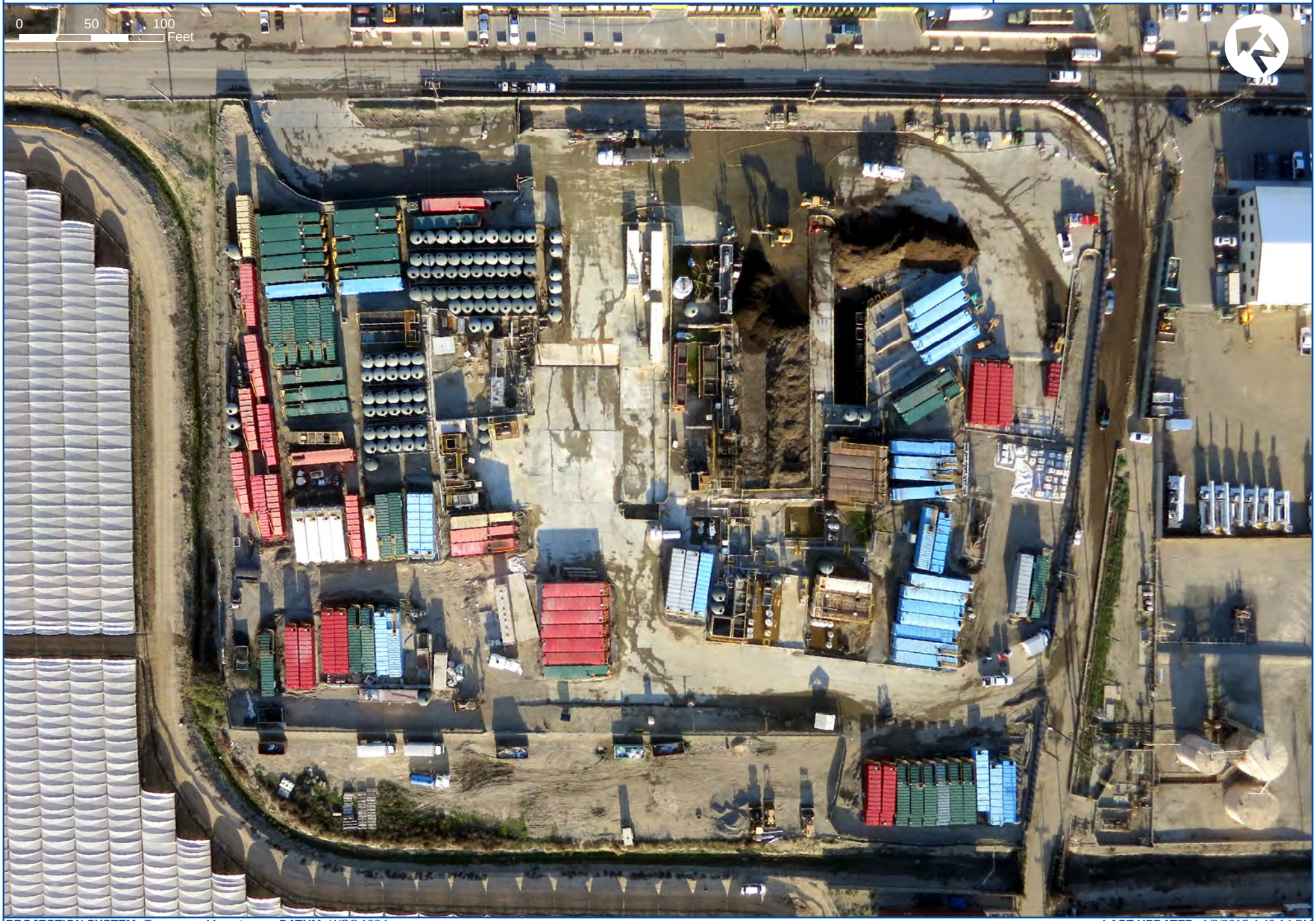


PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/2/2014 10:10:34 AM*

Aerial Overview - 1/09/2015

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

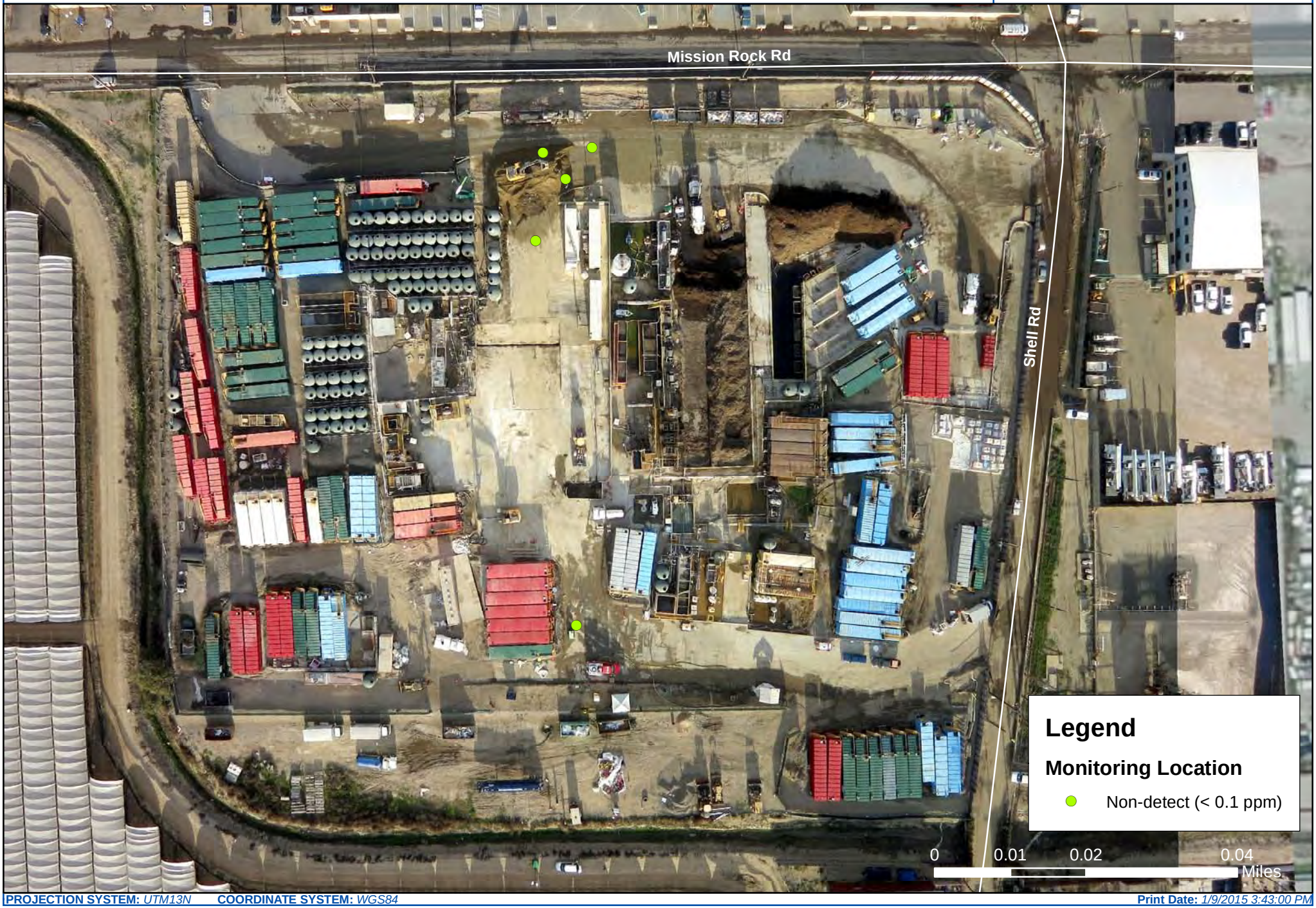


PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *1/9/2015 4:46:14 PM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Jan 09, 2015 07:00 to Jan 09, 2015 12:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *1/9/2015 3:43:00 PM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Jan 09, 2015 07:00 to Jan 09, 2015 12:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *1/9/2015 3:46:40 PM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Jan 09, 2015 07:00 to Jan 09, 2015 12:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *1/9/2015 3:45:31 PM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Jan 09, 2015 07:00 to Jan 09, 2015 12:00

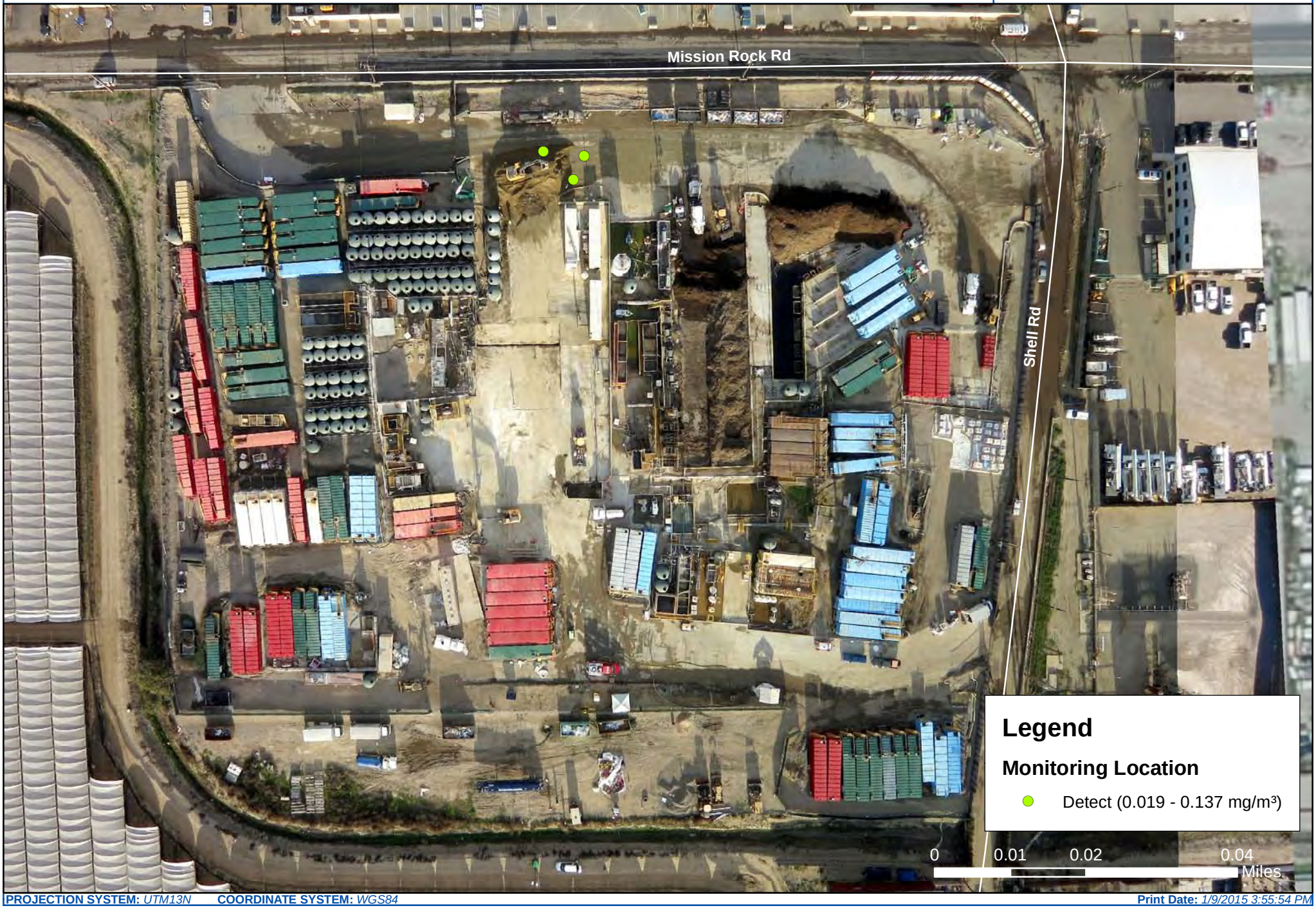
CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *1/9/2015 3:48:32 PM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Jan 09, 2015 07:00 to Jan 09, 2015 12:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



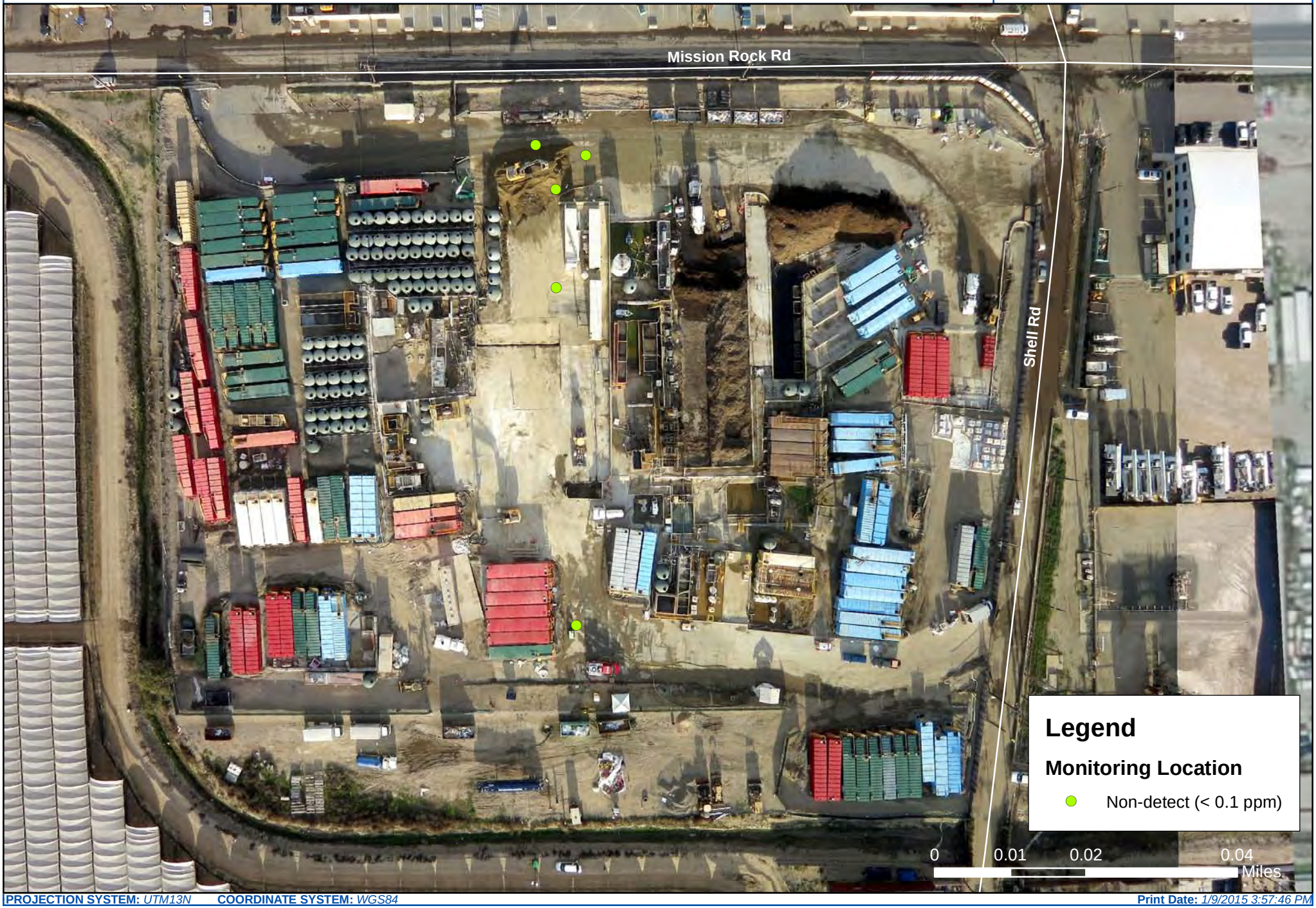
PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *1/9/2015 3:55:54 PM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Jan 09, 2015 07:00 to Jan 09, 2015 12:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *1/9/2015 3:57:46 PM*

Manually Logged Real-Time Air Monitoring Concentrations

VOC - Jan 09, 2015 07:00 to Jan 09, 2015 12:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *1/9/2015 3:41:29 PM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map

AreaRAE and AM510 Locations

Mission Incident

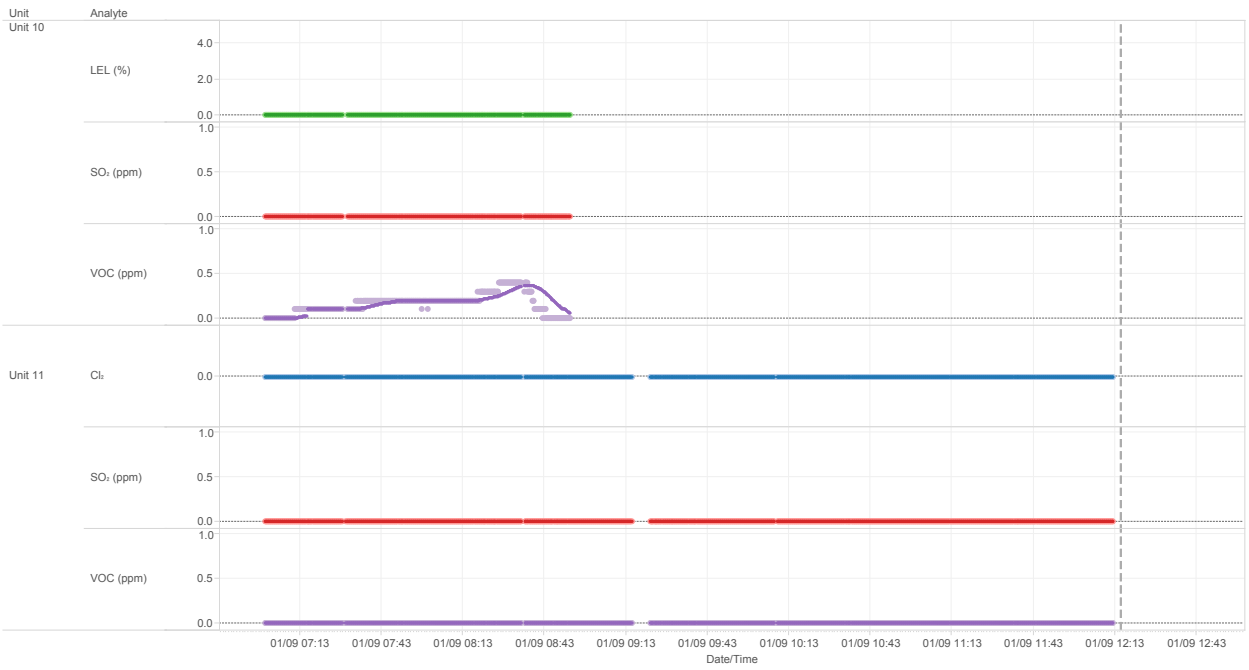
Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *1/9/2015 10:54:06 AM*

Patriot Environmental
AreaRAE Trend Graphs
1/09/2015 07:00 - 1/09/2015 13:00

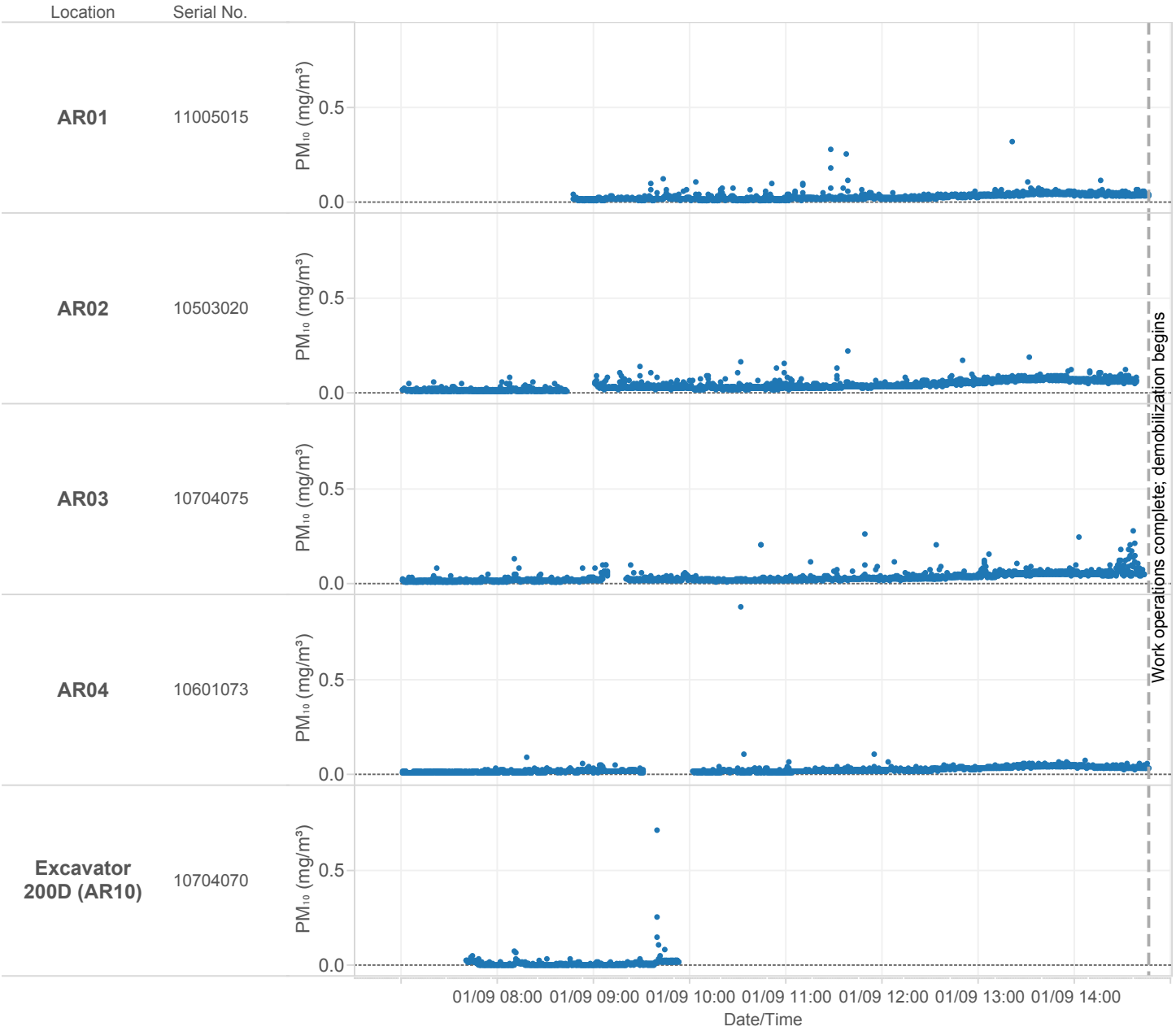
- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
1/09/2015 07:00 - 1/09/2015 13:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM_{10}) Summary
1/09/2015 07:00 - 1/09/2015 14:45



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format